

DOCUMENT NO. 89.**BOARD OF ALDERMEN,**

FEBRUARY 15th, 1836.

The following communication was received from his Honor the Mayor, enclosing a communication from Stephen Allen, Esq., Chairman of the Water Commissioners, and from D. B. Douglass, Esq., Chief Engineer, N. Y. Aqueduct, in relation to the practicability, and probable expense of forcing by Steam Engines, a sufficient quantity of water from the North or East River to a reservoir to be erected on Murray Hill, in aid of the present means for extinguishing fires, which was referred to the Committee on Fire and Water, and directed to be printed.

J. MORTON, Clerk.

*Mayor's Office,
New-York, February 15th, 1836.*

GENTLEMEN OF THE COMMON COUNCIL,

The great number of fires, and the heavy losses sustained by that element, have made me feel a great solicitude to obtain a more full supply of water ; and as we have

an abundance on every side, I cannot entertain a doubt that adequate means ought to be applied to have reservoirs of salt water, if it be impossible to obtain fresh, in sufficient quantity to effect the object. I, therefore, some weeks since, asked Mr. Allen, the Chairman of the Water Commissioners, to furnish an estimate of the expence of filling the contemplated reservoir at Murray's Hill. Some other conversation ensued on the subject, and on the 11th inst. I received the accompanying communication, with the annexed report, to the Water Commissioners, by Major Douglass.

If an abundant supply of fresh water can be procured for the purpose of extinguishing fires, it is greatly to be preferred; for in that case the pipes and fixtures could be applied for the water to be received from the Croton River; but if used for salt water, they might be injured and lost to the public.

I feel bound to state my conviction, that every consideration of public duty, requires of us the most efficient measures to obtain a plentiful supply of water as the best security against extensive fires.

I deem it my duty also, to recommend that application be made to the Legislature, at the present Session, for an amendment or alteration in the laws, for the prevention of fires, and especially in relation to buildings within the limits. That subject has been examined in a variety of communications to the Common Council, and is one of great importance.

C. W. LAWRENCE.

*Office of the Water Commissioners, }
February 11th, 1836. }*

HON. C. W. LAWRENCE,

Dear Sir,—

In accordance with your wish, as I understood you, that the Water Commissioners would cause an examination to be made as to the practicability, and probable expense of forcing

by steam engines, a sufficient quantity of water, from the North or East River, to a reservoir, to be erected on Murray Hill, in aid of the present means for extinguishing fires, we have the honor of laying before you a Report from our Engineer on the subject.

The distance from the site of a reservoir on Murray Hill to the North River, is stated to be about 5,100 feet, while to the East River it is only 3,900 feet, and, therefore, it is proposed to draw the water from the East River, as the least expensive of the two projects.

The Engineer proposes erecting an Engine at the foot of 40th-street, on the East River, and from thence to force the water to a receiving tank, to be built on a high ridge of land immediately in the vicinity of the river, and from said tank, to lead it by iron pipes following the sinuosity of the ground, to a reservoir to be erected on Murray Hill.

It is further proposed, that the engine shall be of 25 or 30 horse power, which will be able to raise from the river about three millions of gallons of water every 24 hours, and place it in the reservoir through a conduit pipe of 20 inches in diameter.

The total expense for the necessary buildings, machinery, iron conduit pipes, damages to land, and contingencies, is estimated at \$75,050. This, however, does not include the reservoir at Murray Hill, as that, when built, will be merged in the expense of supplying the city with water ; nor does it include the necessary conduit-pipes from said reservoir, to those now laid to the south of 13th-street.

The Engineer has also entered into an estimate of the expense of working a 30 horse engine per day, which for fuel, attendance, wear and tear, &c., amounts to the sum of \$29 for every 24 hours work, or allowing 300 working days to the year, to \$8,700 per annum. The annual expense to the city, therefore, adopting this data, and including interest on the capital to be expended, both for bringing the

water from the river to Murray Hill, and conducting it from there to the pipes already laid south of 13th-street, cannot be less than from eighteen to twenty thousand dollars per annum.

The time that would be necessary for building a reservoir on Murray Hill, erect the receiving tank, engine house, &c., and obtain pipes of large dimensions, as well to bring the water from Murray Hill to the conduits already laid in the city, as to conduct it from the river to the reservoir, would be so great, before the work would be completed, and a sufficient quantity of water furnished, that the utility of the measure could hardly compensate for the cost, taking into consideration the fact, that a large portion of the expense would be lost when the city shall be supplied with the waters of the Croton River and its tributaries.

It has been suggested, that it would be much better to carry the water from the East River, immediately to the tank on 13th-street; and upon this suggestion the Engineer was requested to make an estimate of the cost of this project also. In this case the necessary reservoir is now ready to receive the water; Thirteenth-street being regulated, the pipes from the river may be laid in a straight line instead of undulating, as in the other case, and the water may be forced direct to the reservoir without obstruction; and, in addition, the expense of connecting with the reservoir, the pipes already laid will be avoided, together with the saving of much time, as well as cost, in effecting the same object.

The Engineer is of opinion that the capacity of an engine for this purpose, need not be more than 15 horse power, and that the whole cost would not exceed \$55,550. The daily expense of working the engine 12 hours, which would be quite sufficient, in addition to the present supply, he estimates at 8 dollars, or for the whole year of 365 days, \$2,920. Allowing interest on the capital expended, at six per cent., and adding the annual cost of keeping the works

in operation, the whole expense to the city, per year, would only amount to the sum of \$6,253.

We beg leave to refer to the accompanying report of the Engineer, with the profile and diagram annexed, for a more particular expose of the subject.

By order of the Board,

STEPHEN ALLEN, *Chairman.*

To Stephen Allen, Esq., Chairman, and Messrs. Fox, Brown, Dusenberry, and Allen, Water Commissioners.

GENTLEMEN—

In compliance with the resolution of the Board, of the 12th ultimo, I now respectfully lay before you the following *Report* on the practicability and expense of raising water from the *North* or *East* river by steam power, and delivering it into the contemplated reservoir on Murray's Hill, with a view of using it, in anticipation of the Croton aqueduct, for the extinguishment of fires.

The first inquiry is, of course, to determine which of the two rivers, the *North* or the *East*, can be most conveniently resorted to for this purpose. By referring to the city plot in the Street Commissioner's Office, it appears that the relative *distances* are as follows, viz: From the site of the reservoir to the *North river*, measured on the line of 42d-street, a little over 1700 yards, and to the *East river*, on the line of 40th-street, only 1300 yards, making a clear difference of more than 400 yards in favor of the latter. The circumstances of the ground on the *East river* side also appears, in some respects, better adapted to the disposition and construction of the works, than those of the

North river shore, and *this* consideration, in connexion with that of the *distance*, is deemed conclusive in favor of the *East river*. (See the annexed trace.)

The proper position for the *Steam Engine, Force Pump, &c.*, is next to be considered, and for this purpose a variety of situations offer between the head of Kip's Bay and the foot of 42d-street. A corresponding point on the summit of the ridge north of the Bay, would, in either case, furnish a good site for the receiving tank, and from thence to the reservoir on Murray's Hill, a line of main could be laid down by *either* of the intervening streets. The annexed profile exhibits the undulations and relief of the ground between the river and Murray's Hill on the line of 40th-street, and, with some slight variations of detail, would equally serve for either of the neighboring streets. Taking it as an example, therefore, the position of the engine and pump is indicated at the water's edge, and on the top of the hill, immediately above the position for the receiving tank; sufficiently elevated to admit a water surface some feet above that of the Murray Hill reservoir. Into this tank, the water being received from the stroke of the engine, would be impelled thence onward, through the conducting main, by the action of the head of water thus maintained. An arrangement of this kind gives great ease and elasticity to the action of the engine, and essentially diminishes the wear and tear, both of the engine itself, and of the works connected therewith. Such is the general outline of the works contemplated in the instructions of the Board. As to their practicability, it is too obvious to require any particular illustration here; and it only remains, therefore, in the literal fulfilment of my duty, to submit the following statement of the power of the engine, and the cost of the entire work :

The engine for this work, if undertaken, should be of 25 or 30 horse power, at the least, and the latter is preferred. An engine of this capacity would raise to the height required about three millions gallons in one day of 24 hours,

or one and a half millions in 12 hours, and less than this, it is thought, would not insure the object of affording, under all circumstances, an ample and certain supply. For the easy and prompt delivery of this quantity into the reservoir, the conduit pipe should not be less than twenty inches in diameter, and with these data we are now prepared to estimate the expenses of the works, as follows, viz:—

For the engine itself,	6,500
Buildings, pump, fixtures, &c.,	10,500
Tank, complete,	8,000
Main conduit, say 3900 feet, at \$8 50,	33,150
Extra expense laying do. part rock, (street not being graded)	3,900
Land and damages,	8,000
Contingencies, superintendence, &c. say,	5,000
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	\$75,050

The following is also an estimate of the daily expense of working a thirty horse engine, twenty-four hours per day, viz:—

Fuel,	\$23 10
Attendance,	5 00
Oil 28, wear and tear 62, -	90
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Total,	\$29 00 per diem.

Say 300 days, \$8,700 00 per annum.

In submitting the foregoing remarks and calculations, I have perhaps said all that is strictly required of me by the terms of the resolution, and the Board are now in possession of the data for estimating the practicability and the expense of the contemplated work. There still remains, however, a question of no little importance in reference to the practical utility of this project, about which I must beg leave

to add a remark or two, viz: How far the proposed plan, even though it should be considered unexceptionable in the respects mentioned, is really calculated to afford that prompt and efficient security to the city against fire, which is its chief object?

The Board will not fail to remark, that the reservoir which is to be filled by this work is not yet built, and that the pipes by which its supplies are to be rendered available to the city, are also, generally speaking, yet to be laid; that both these works are of great magnitude, and will probably require some years to complete them in a substantial manner on the scale contemplated; during all which time the works now suggested would be anavailable. It might partially obviate the objection in the meanwhile, to lay a conduit pipe from Murray's Hill to the tank in Thirteenth-street, and thus bring the new supply to operate through the *present* system of pipes, but if this be a good idea, *that* recently suggested by a member of this Board is still better, viz: to throw the new supply directly into the tank in Thirteenth-street, irrespectively of the Murray's Hill reservoir altogether.

It seems to be understood from the inquiries which have been made, that if, by any means, this tank could be kept, under all circumstances, and in every state of demand, *absolutely full*, it would probably afford as great a degree of facility in putting out fires as can be realized, *until* the waters of the Croton are received and distributed through the city.

It is also stated that springs of fresh water may be obtained by moderate diggings on the east side of the city, from which a supply, altogether sufficient for this purpose, may be procured, in which case the injury to which the pipes, plugs, and stop-cocks, as well as goods, furniture and buildings, would be in some degree exposed by the use of *salt* water, may be avoided.

The facilities of this supply may be extended to all parts of the city, by laying down the residue of the pipes, with much less delay than would be necessary for laying down an entire new system; and *without loss of labor*, if that residue be laid in conformity with the system recommended by the Water Commissioners.

The expense of this additional supply would be much less than that of the works above estimated. The capacity of the engine, in addition to those now in use, need not be more than 15 horse power, and the diameter of the main certainly not more than fifteen inches, from which data the estimate would stand as follows, viz :

Engine itself, say,	\$3,000
Wells, pumps and buildings,	9,000
Tank on the same premises with the engine,	5,750
Say 3500 feet of 15 inch main, at \$6,	21,000
Lands and damages,	12,000
Contingencies, superintendence, &c., say	4,000
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	\$55,550

Daily expense of working the engine 12

hours per day, \$8 00

And *per annum*, allowing 365 days, \$2,920 00

Finally, this additional supply being independent of any other ulterior construction, could be realized for the benefit of the city within six months after the works shall have been commenced.

All which is respectfully submitted.

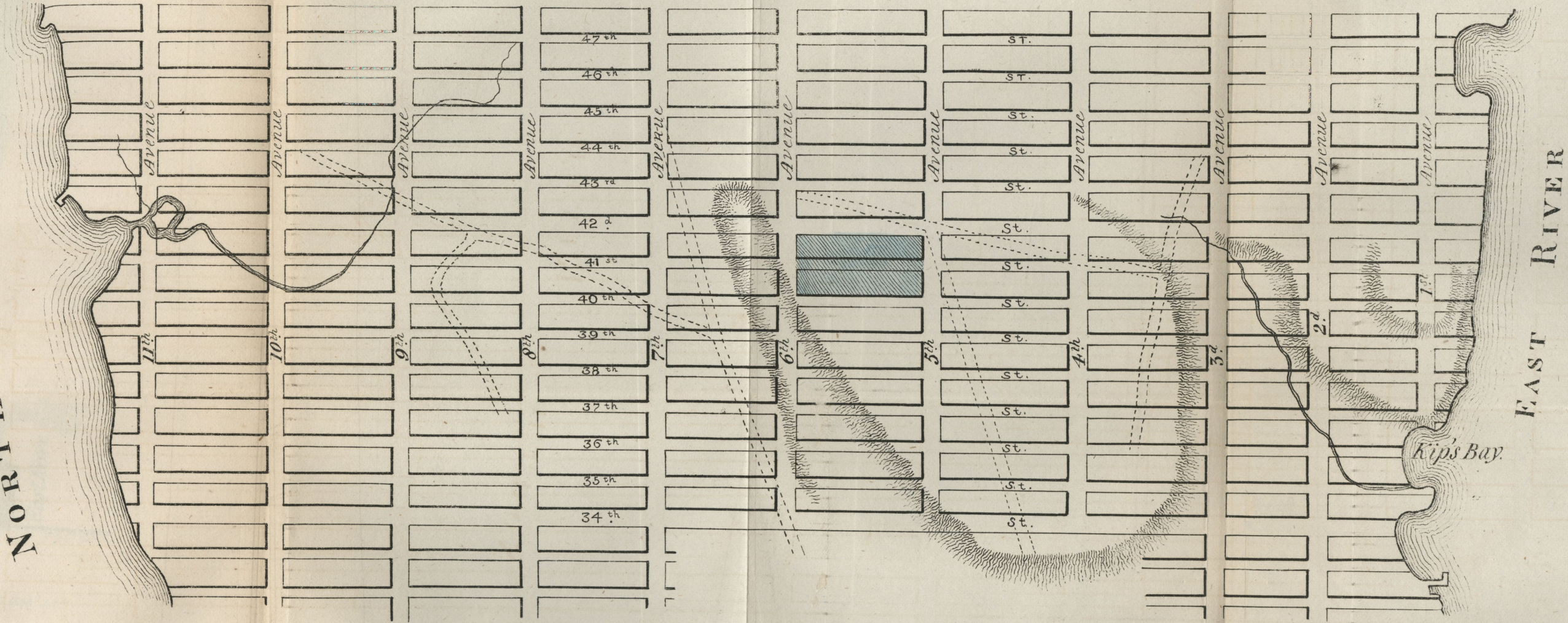
D. B. DOUGLASS,

Ch. Eng'r, N. Y. Aqueduct.

N. Y. Water Commissioners' Office, }
 Engineer Department, 5th Febr'y. }
 1836.

Trace of the ground between Murray's Hill and the North & East Rivers.

NORTH
RIVER



Profile on 40th Street

